

**NASA JPL
Data Validation Reports
LDC# 10006**

Chromium

LDC

**Laboratory Data Consultants, Inc.
Data Validation Report**

Project/Site Name: NASA JPL
Collection Date: January 29 through February 3, 2003
LDC Report Date: March 28, 2003
Matrix: Water
Parameters: Chromium
Validation Level: EPA Level III
Laboratory: Advanced Technology Laboratories
Sample Delivery Group (SDG): 03-1425

Sample Identification

MW-21-5	MW-20-3MS
MW-21-4	MW-20-3MSD
MW-21-3	MW-20-3DUP
MW-21-2	DUPE-2-IQ03DUP
MW-21-1	
EB-1-1/29/03	
MW-20-5	
MW-20-4	
MW-20-3	
MW-20-2	
MW-20-1	
EB-2-1/30/03	
DUPE-1-IQ03	
MW-19-5	
MW-19-4	
MW-19-3	
MW-19-2	
MW-19-1	
EB-3-2/3/03	
DUPE-2-IQ03	

Introduction

This data review covers 24 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 200.8 for Chromium.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review (February 1994) as there are no current guidelines for the methods stated above.

A table summarizing all data qualification flags is provided at the end of this report. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from specified protocols or is of technical advisory nature.

Blanks are summarized in Section III.

Field duplicates are summarized in Section XIII.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

- U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.
- J Indicates an estimated value.
- R Quality control indicates the data is not usable.
- N Presumptive evidence of presence of the constituent.
- UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.
- None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. Calibration

An initial calibration was performed.

The frequency and analysis criteria of the initial calibration verification (ICV) and continuing calibration verification (CCV) were met.

III. Blanks

Method blanks were reviewed for each matrix as applicable.

Data qualification by the initial, continuing and preparation blanks (ICB/CCB/PBs) was based on the maximum contaminant concentration in the ICB/CCB/PBs in the analysis of each analyte. No contaminant concentrations were found in the initial, continuing and preparation blanks with the following exceptions:

Method Blank ID	Analyte	Maximum Concentration	Associated Samples
PB1 (prep blank)	Chromium	0.213 ug/L	MW-21-5 MW-21-4 MW-21-3 MW-21-2 MW-21-1 EB-1-1/29/03 MW-20-5 MW-20-4 MW-20-2 MW-20-1 EB-2-1/30/03 DUPE-1-IQ03 MW-19-5 MW-19-4 MW-19-3 MW-19-2 MW-19-1 EB-3-2/3/03 DUPE-2-IQ03

Method Blank ID	Analyte	Maximum Concentration	Associated Samples
ICB/CCB1	Chromium	0.315 ug/L	MW-21-5 MW-21-4 MW-21-3 MW-21-2 MW-21-1 EB-1-1/29/03 MW-20-5 MW-20-4 MW-20-2 MW-20-1 EB-2-1/30/03 DUPE-1-IQ03 MW-19-5 MW-19-4 MW-19-3 MW-19-2 MW-19-1 EB-3-2/3/03 DUPE-2-IQ03
PB2 (prep blank)	Chromium	0.381 ug/L	MW-20-3
ICB/CCB2	Chromium	0.376 ug/L	MW-20-3

Sample concentrations were compared to the maximum contaminant concentrations detected in the ICB/CCB/PBs. The sample concentrations were either not detected or were significantly greater (>5X blank contaminants) than the concentrations found in the associated method blanks with the following exceptions:

Sample	Analyte	Reported Concentration	Modified Final Concentration
MW-20-3	Chromium	1.7 ug/L	1.7U ug/L

IV. ICP Interference Check Sample (ICS) Analysis

ICP interference check was not required by the method.

V. Matrix Spike Analysis

Matrix spike (MS) and matrix spike duplicate (MSD) samples were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits.

VI. Duplicate Sample Analysis

Duplicate (DUP) sample analyses were reviewed for each matrix as applicable. Results were within QC limits.

VII. Laboratory Control Samples (LCS)

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) were within QC limits.

VIII. Internal Standards (ICP-MS)

All internal standard percent recoveries (%R) were within QC limits.

IX. Furnace Atomic Absorption QC

Graphite furnace atomic absorption was not utilized in this SDG.

X. ICP Serial Dilution

ICP serial dilution was not required by the method.

XI. Sample Result Verification

Raw data were not reviewed for this SDG.

XII. Overall Assessment of Data

Data flags have been summarized at the end of this report.

XIII. Field Duplicates

Samples MW-20-1 and DUPE-1-IQ03 and samples MW-19-4 and DUPE-2-IQ03 were identified as field duplicates. No chromium was detected in any of the samples with the following exceptions:

Analyte	Concentration (ug/L)		RPD
	MW-20-1	DUPE-1-IQ03	
Chromium	2.8	2.5	11

Analyte	Concentration (ug/L)		RPD
	MW-19-4	DUPE-2-IQ03	
Chromium	2.3	1.9	19

XIV. Field Blanks

Samples EB-1-1/29/03, EB-2-1/30/03 and EB-3-2/3/03 were identified as equipment blanks. No chromium contaminants were found in these blanks.

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Chromium - Data Qualification Summary - SDG 03-1425

No Sample Data Qualified in this SDG

NASA JPL

Chromium - Laboratory Blank Data Qualification Summary - SDG 03-1425

SDG	Sample	Analyte	Modified Final Concentration	A or P
03-1425	MW-20-3	Chromium	1.7U ug/L	A

10006 B.

Advanced Technology Laboratories

Date: 25-Feb-03

CLIENT: Applied P & Ch Laboratories
Lab Order: 061277
Project: JPL
Lab ID: 061277-001A

Client Sample ID: MW-21-5
Collection Date: 1/29/2003 8:40:00 AM
Matrix: WATER

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
----------	--------	-------	------	-------	----	---------------

ICP-MS METALS

EPA 200.8

RunID: ICP4_030217A	QC Batch: R25095					Analyst: RQ
Chromium	5.7	1.0		µg/L	1	2/17/2003

9/3/28/03

Qualifiers:	ND - Not Detected at the Reporting Limit	S - Spike/Surrogate outside of limits due to matrix interferen
	J - Analyte detected below quantitation limits	H - Sample exceeded analytical holding time
	B - Analyte detected in the associated Method Blank	E - Value above quantitation range
	DO - Surrogate Diluted Out	Results are wet unless otherwise specified

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3275 Walnut Avenue Signal Hill, CA 90807 Tel: 562 989-4045 Fax: 562 989-4040

Advanced Technology Laboratories

Date: 25-Feb-03

CLIENT: Applied P & Ch Laboratories
Lab Order: 061277
Project: JPL
Lab ID: 061277-002A

Client Sample ID: MW-21-4
Collection Date: 1/29/2003 9:15:00 AM
Matrix: WATER

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
----------	--------	-------	------	-------	----	---------------

ICP-MS METALS

EPA 200.8

RunID: ICP4_030217A	QC Batch: R25095					Analyst: RQ
Chromium	4.7	1.0		µg/L	1	2/17/2003

Handwritten signature/initials
3/28/03

Qualifiers: ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
B - Analyte detected in the associated Method Blank
DO - Surrogate Diluted Out

S - Spike/Surrogate outside of limits due to matrix interferen
H - Sample exceeded analytical holding time
E - Value above quantitation range
Results are wet unless otherwise specified

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3275 Walnut Avenue Signal Hill, CA 90807 Tel: 562 989-4045 Fax: 562 989-4040

Advanced Technology Laboratories

Date: 25-Feb-03

CLIENT: Applied P & Ch Laboratories

Client Sample ID: MW-21-3

Lab Order: 061277

Project: JPL

Collection Date: 1/29/2003 12:45:00 PM

Lab ID: 061277-003A

Matrix: WATER

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
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ICP-MS METALS

EPA 200.8

RunID: ICP4_030217A

QC Batch: R25095

Analyst: RQ

Chromium

5.9

1.0

µg/L

1

2/17/2003

Handwritten signature and date: 3/28/03

Qualifiers: ND - Not Detected at the Reporting Limit

S - Spike/Surrogate outside of limits due to matrix interferen

J - Analyte detected below quantitation limits

H - Sample exceeded analytical holding time

B - Analyte detected in the associated Method Blank

E - Value above quantitation range

DO - Surrogate Diluted Out

Results are wet unless otherwise specified

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013

Advanced Technology Laboratories

Date: 25-Feb-03

CLIENT: Applied P & Ch Laboratories
Lab Order: 061277
Project: JPL
Lab ID: 061277-004A

Client Sample ID: MW-21-2
Collection Date: 1/29/2003 1:20:00 PM
Matrix: WATER

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
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ICP-MS METALS

EPA 200.8

RunID: ICP4_030217A	QC Batch: R25095					Analyst: RQ
Chromium	6.7	1.0		µg/L	1	2/17/2003

3/28/07

Qualifiers: ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
B - Analyte detected in the associated Method Blank
DO - Surrogate Diluted Out
S - Spike/Surrogate outside of limits due to matrix interferen
H - Sample exceeded analytical holding time
E - Value above quantitation range
Results are wet unless otherwise specified

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Advanced Technology Laboratories

Date: 25-Feb-03

CLIENT: Applied P & Ch Laboratories
Lab Order: 061277
Project: JPL
Lab ID: 061277-005A

Client Sample ID: MW-21-1
Collection Date: 1/29/2003 2:00:00 PM
Matrix: WATER

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
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ICP-MS METALS

EPA 200.8

RunID: ICP4_030217A	QC Batch: R25095					Analyst: RQ
Chromium	4.6	1.0		µg/L	1	2/17/2003

Qualifiers: ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
B - Analyte detected in the associated Method Blank
DO - Surrogate Diluted Out
S - Spike/Surrogate outside of limits due to matrix interferen
H - Sample exceeded analytical holding time
E - Value above quantitation range
Results are wet unless otherwise specified

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015

Advanced Technology Laboratories

Date: 25-Feb-03

CLIENT: Applied P & Ch Laboratories
Lab Order: 061277
Project: JPL
Lab ID: 061277-006A

Client Sample ID: EB-1-1/29/03
Collection Date: 1/29/2003 2:10:00 PM
Matrix: WATER

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
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ICP-MS METALS

EPA 200.8

RunID: ICP4_030217A	QC Batch: R25095					Analyst: RQ
Chromium	ND	1.0		µg/L	1	2/17/2003

2/28/03

Qualifiers: ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
B - Analyte detected in the associated Method Blank
DO - Surrogate Diluted Out

S - Spike/Surrogate outside of limits due to matrix interferen
H - Sample exceeded analytical holding time
E - Value above quantitation range
Results are wet unless otherwise specified

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016

Advanced Technology Laboratories

Date: 25-Feb-03

CLIENT: Applied P & Ch Laboratories
Lab Order: 061277
Project: JPL
Lab ID: 061277-007A

Client Sample ID: MW-20-5
Collection Date: 1/30/2003 8:25:00 AM
Matrix: WATER

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
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ICP-MS METALS

EPA 200.8

RunID: ICP4_030217A	QC Batch: R25095					Analyst: RQ
Chromium	2.7	1.0		µg/L	1	2/17/2003

3/28/03

Qualifiers: ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
B - Analyte detected in the associated Method Blank
DO - Surrogate Diluted Out
S - Spike/Surrogate outside of limits due to matrix interference
H - Sample exceeded analytical holding time
E - Value above quantitation range
Results are wet unless otherwise specified

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Advanced Technology Laboratories

Date: 25-Feb-03

CLIENT: Applied P & Ch Laboratories
Lab Order: 061277
Project: JPL
Lab ID: 061277-008A

Client Sample ID: MW-20-4
Collection Date: 1/30/2003 9:25:00 AM
Matrix: WATER

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
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ICP-MS METALS

EPA 200.8

RunID: ICP4_030217A	QC Batch: R25095					Analyst: RQ
Chromium	2.4	1.0		µg/L	1	2/17/2003

Qualifiers: ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
B - Analyte detected in the associated Method Blank
DO - Surrogate Diluted Out

S - Spike/Surrogate outside of limits due to matrix interferen
H - Sample exceeded analytical holding time
E - Value above quantitation range
Results are wet unless otherwise specified

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Advanced Technology Laboratories

Date: 25-Feb-03

CLIENT: Applied P & Ch Laboratories
Lab Order: 061277
Project: JPL
Lab ID: 061277-009A

Client Sample ID: MW-20-3
Collection Date: 1/30/2003 10:55:00 AM
Matrix: WATER

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
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ICP-MS METALS

EPA 200.8

RunID: ICP4_030224A	QC Batch: R25311					Analyst: RQ
Chromium	1.7	1.0		µg/L	1	2/24/2003

U

Qualifiers: ND - Not Detected at the Reporting Limit S - Spike/Surrogate outside of limits due to matrix interferen
J - Analyte detected below quantitation limits H - Sample exceeded analytical holding time
B - Analyte detected in the associated Method Blank E - Value above quantitation range
DO - Surrogate Diluted Out Results are wet unless otherwise specified

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3275 Walnut Avenue Signal Hill, CA 90807 Tel: 562 989-4045 Fax: 562 989-4040

Advanced Technology Laboratories

Date: 25-Feb-03

CLIENT: Applied P & Ch Laboratories

Client Sample ID: MW-20-2

Lab Order: 061277

Project: JPL

Collection Date: 1/30/2003 11:40:00 AM

Lab ID: 061277-010A

Matrix: WATER

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
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ICP-MS METALS**EPA 200.8**

RunID: ICP4_030217A

QC Batch: R25095

Analyst: RQ

Chromium

2.2

1.0

µg/L

1

2/17/2003

2/28/03

Qualifiers: ND - Not Detected at the Reporting Limit

S - Spike/Surrogate outside of limits due to matrix interferen

J - Analyte detected below quantitation limits

H - Sample exceeded analytical holding time

B - Analyte detected in the associated Method Blank

E - Value above quantitation range

DO - Surrogate Diluted Out

Results are wet unless otherwise specified

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Advanced Technology Laboratories

Date: 25-Feb-03

CLIENT: Applied P & Ch Laboratories

Client Sample ID: MW-20-1

Lab Order: 061277

Project: JPL

Collection Date: 1/30/2003 1:00:00 PM

Lab ID: 061277-011A

Matrix: WATER

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
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ICP-MS METALS

EPA 200.8

RunID: ICP4_030217A

QC Batch: R25095

Analyst: RQ

Chromium

2.8

1.0

µg/L

1

2/17/2003

Qualifiers: ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
B - Analyte detected in the associated Method Blank
DO - Surrogate Diluted Out

S - Spike/Surrogate outside of limits due to matrix interference
H - Sample exceeded analytical holding time
E - Value above quantitation range
Results are wet unless otherwise specified

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3275 Walnut Avenue Signal Hill, CA 90807 Tel: 562 989-4045 Fax: 562 989-4040

Advanced Technology Laboratories

Date: 25-Feb-03

CLIENT: Applied P & Ch Laboratories

Client Sample ID: EB-2-1/30/03

Lab Order: 061277

Project: JPL

Collection Date: 1/30/2003 1:40:00 PM

Lab ID: 061277-012A

Matrix: WATER

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
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ICP-MS METALS

EPA 200.8

RunID: ICP4_030217A

QC Batch: R25095

Analyst: RQ

Chromium

ND

1.0

µg/L

1

2/17/2003

Qualifiers: ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
B - Analyte detected in the associated Method Blank
DO - Surrogate Diluted Out

S - Spike/Surrogate outside of limits due to matrix interferen
H - Sample exceeded analytical holding time
E - Value above quantitation range
Results are wet unless otherwise specified

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Advanced Technology
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022

3/28/02

Advanced Technology Laboratories

Date: 25-Feb-03

CLIENT: Applied P & Ch Laboratories

Client Sample ID: Dupe-1-IQ03

Lab Order: 061277

Project: JPL

Collection Date:

Lab ID: 061277-013A

Matrix: WATER

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
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ICP-MS METALS**EPA 200.8**

RunID: ICP4_030217A

QC Batch: R25095

Analyst: RQ

Chromium

2.5

1.0

µg/L

1

2/17/2003

Handwritten signature
3/28/03

Qualifiers: ND - Not Detected at the Reporting Limit

S - Spike/Surrogate outside of limits due to matrix interferen

J - Analyte detected below quantitation limits

H - Sample exceeded analytical holding time

B - Analyte detected in the associated Method Blank

E - Value above quantitation range

DO - Surrogate Diluted Out

Results are wet unless otherwise specified

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023

Advanced Technology Laboratories

Date: 25-Feb-03

CLIENT: Applied P & Ch Laboratories

Client Sample ID: MW-19-5

Lab Order: 061277

Project: JPL

Collection Date: 2/3/2003 8:10:00 AM

Lab ID: 061277-014A

Matrix: WATER

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
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ICP-MS METALS

EPA 200.8

RunID: ICP4_030217A

QC Batch: R25095

Analyst: RQ

Chromium

3.4

1.0

µg/L

1

2/17/2003

Qualifiers: ND - Not Detected at the Reporting Limit

J - Analyte detected below quantitation limits

B - Analyte detected in the associated Method Blank

DO - Surrogate Diluted Out

S - Spike/Surrogate outside of limits due to matrix interferen

H - Sample exceeded analytical holding time

E - Value above quantitation range

Results are wet unless otherwise specified

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3275 Walnut Avenue Signal Hill, CA 90807 Tel: 562 989-4045 Fax: 562 989-4040

Advanced Technology Laboratories

Date: 25-Feb-03

CLIENT: Applied P & Ch Laboratories

Client Sample ID: MW-19-4

Lab Order: 061277

Project: JPL

Collection Date: 2/3/2003 9:20:00 AM

Lab ID: 061277-015A

Matrix: WATER

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
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ICP-MS METALS

EPA 200.8

RunID: ICP4_030217A

QC Batch: R25095

Analyst: RQ

Chromium

2.3

1.0

µg/L

1

2/17/2003

per 2/28/03

Qualifiers: ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
B - Analyte detected in the associated Method Blank
DO - Surrogate Diluted Out

S - Spike/Surrogate outside of limits due to matrix interferen
H - Sample exceeded analytical holding time
E - Value above quantitation range
Results are wet unless otherwise specified

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Advanced Technology
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3275 Walnut Avenue Signal Hill, CA 90807 Tel: 562 989-4045 Fax: 562 989-4040

Advanced Technology Laboratories

Date: 25-Feb-03

CLIENT: Applied P & Ch Laboratories
Lab Order: 061277
Project: JPL
Lab ID: 061277-016A

Client Sample ID: MW-19-3

Collection Date: 2/3/2003 11:05:00 AM

Matrix: WATER

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
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ICP-MS METALS

EPA 200.8

RunID: ICP4_030217A

QC Batch: R25095

Analyst: RQ

Chromium

5.1

1.0

µg/L

1

2/17/2003

2/28/03

Qualifiers: ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
B - Analyte detected in the associated Method Blank
DO - Surrogate Diluted Out

S - Spike/Surrogate outside of limits due to matrix interference
H - Sample exceeded analytical holding time
E - Value above quantitation range
Results are wet unless otherwise specified

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Advanced Technology
Laboratories

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3275 Walnut Avenue Signal Hill, CA 90807 Tel: 562 989-4045 Fax: 562 989-4040

Advanced Technology Laboratories

Date: 25-Feb-03

CLIENT: Applied P & Ch Laboratories
Lab Order: 061277
Project: JPL
Lab ID: 061277-017A

Client Sample ID: MW-19-2
Collection Date: 2/3/2003 10:20:00 AM
Matrix: WATER

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
----------	--------	-------	------	-------	----	---------------

ICP-MS METALS

EPA 200.8

RunID: ICP4_030217A	QC Batch: R25095					Analyst: RQ
Chromium	6.0	1.0		µg/L	1	2/17/2003

3/28/03

Qualifiers:	ND - Not Detected at the Reporting Limit	S - Spike/Surrogate outside of limits due to matrix interferen
	J - Analyte detected below quantitation limits	H - Sample exceeded analytical holding time
	B - Analyte detected in the associated Method Blank	E - Value above quantitation range
	DO - Surrogate Diluted Out	Results are wet unless otherwise specified

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Advanced Technology
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3275 Walnut Avenue Signal Hill, CA 90807 Tel: 562 989-4045 Fax: 562 989-4040

Advanced Technology Laboratories

Date: 25-Feb-03

CLIENT: Applied P & Ch Laboratories

Client Sample ID: MW-19-1

Lab Order: 061277

Project: JPL

Collection Date: 2/3/2003 11:45:00 AM

Lab ID: 061277-018A

Matrix: WATER

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
----------	--------	-------	------	-------	----	---------------

ICP-MS METALS

EPA 200.8

RunID: ICP4_030217A

QC Batch: R25095

Analyst: RQ

Chromium

2.6

1.0

µg/L

1

2/17/2003

Handwritten signature
2/28/03

Qualifiers: ND - Not Detected at the Reporting Limit

J - Analyte detected below quantitation limits

B - Analyte detected in the associated Method Blank

DO - Surrogate Diluted Out

S - Spike/Surrogate outside of limits due to matrix interference

H - Sample exceeded analytical holding time

E - Value above quantitation range

Results are wet unless otherwise specified

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Advanced Technology
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3275 Walnut Avenue Signal Hill, CA 90807 Tel: 562 989-4045 Fax: 562 989-4040

Advanced Technology Laboratories

Date: 25-Feb-03

CLIENT: Applied P & Ch Laboratories

Client Sample ID: EB-3-2/3/03

Lab Order: 061277

Project: JPL

Collection Date: 2/3/2003 9:25:00 AM

Lab ID: 061277-019A

Matrix: WATER

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
----------	--------	-------	------	-------	----	---------------

ICP-MS METALS

EPA 200.8

RunID: ICP4_030217A

QC Batch: R25095

Analyst: RQ

Chromium

ND

1.0

µg/L

1

2/17/2003

Handwritten signature/initials

Qualifiers: ND - Not Detected at the Reporting Limit

S - Spike/Surrogate outside of limits due to matrix interferen

J - Analyte detected below quantitation limits

H - Sample exceeded analytical holding time

B - Analyte detected in the associated Method Blank

E - Value above quantitation range

DO - Surrogate Diluted Out

Results are wet unless otherwise specified

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Advanced Technology
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3275 Walnut Avenue Signal Hill, CA 90807 Tel: 562 989-4045 Fax: 562 989-4040

Advanced Technology Laboratories

Date: 25-Feb-03

CLIENT: Applied P & Ch Laboratories
Lab Order: 061277
Project: JPL
Lab ID: 061277-020A

Client Sample ID: Dupe-2-IQ03**Collection Date:****Matrix:** WATER

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
----------	--------	-------	------	-------	----	---------------

ICP-MS METALS**EPA 200.8**

RunID: ICP4_030217A

QC Batch: R25095

Analyst: RQ

Chromium

1.9

1.0

µg/L

1

2/17/2003

Qualifiers: ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
B - Analyte detected in the associated Method Blank
DO - Surrogate Diluted Out

S - Spike/Surrogate outside of limits due to matrix interference
H - Sample exceeded analytical holding time
E - Value above quantitation range
Results are wet unless otherwise specified

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13/28/03

030



LDC #: 10006B4

VALIDATION COMPLETENESS WORKSHEET

Date: 3-27-03

SDG #: 03-1425

Level III

Page: 1 of 1

Laboratory: Advanced Technology Laboratories

Reviewer: MG

*Chromium*2nd Reviewer: *MG*METHOD: ~~Metals~~ (EPA SW 846 Method 6040B/7000) 200.8*M.G.*

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 1-29-03 through 2-3-03
II.	Calibration	A	
III.	Blanks	SW	
IV.	ICP Interference Check Sample (ICS) Analysis	N	Not required
V.	Matrix Spike Analysis	A	
VI.	Duplicate Sample Analysis	A	
VII.	Laboratory Control Samples (LCS)	A	LCS
VIII.	Internal Standard (ICP-MS)	NA	Not reviewed for
IX.	Furnace Atomic Absorption QC	N	Not utilized
X.	ICP Serial Dilution	N	Not required
XI.	Sample Result Verification	N	
XII.	Overall Assessment of Data	A	
XIII.	Field Duplicates	SW	D = 11 + 13, D = 15 + 20
XIV.	Field Blanks	ND	EB = 6, 12, 19

Note: A = Acceptable
N = Not provided/applicable
SW = See worksheet

ND = No compounds detected
R = Rinsate
FB = Field blank

D = Duplicate
TB = Trip blank
EB = Equipment blank

Validated Samples:

1	MW-21-5	W	11	MW-20-1	W	21	MW-20-3MS	W	31	
2	MW-21-4		12	EB-2-1/30/03		22	MW-20-3MSD		32	
3	MW-21-3		13	DUPE-1-IQ03		23	MW-20-3DUP		33	
4	MW-21-2		14	MW-19-5		24	PBW 1		34	
5	MW-21-1		15	MW-19-4		25	PBW 2		35	
6	EB-1-1/29/03		16	MW-19-3		26	Dupe-2-IQ03 DUP		36	
7	MW-20-5		17	MW-19-2		27			37	
8	MW-20-4		18	MW-19-1		28			38	
9	MW-20-3		19	EB-3-2/3/03		29			39	
10	MW-20-2		20	DUPE-2-IQ03		30			40	

Notes: _____

LDC #: 1000684
SDG #: 03-1425

VALIDATION FINDINGS WORKSHEET
PB/ICB/CCB QUALIFIED SAMPLES

METHOD: Trace Metals (EPA SW 846 Method 6010/7000)
Sample Concentration units, unless otherwise noted: $\mu\text{g/L}$

Soil preparation factor applied: NA
Associated Samples: 1-8, 10-20 (No findings)

Page: 1 of 1
Reviewer: MG
2nd Reviewer: MFR

Sample Identification					Blank Action Limit	Maximum PB* (ug/L)	Maximum ICB/CCB* (ug/L)	Maximum PB* (mg/Kg)	Analyte
Al									Al
Sb									Sb
As									As
Ba									Ba
Be									Be
Cd									Cd
Ca									Ca
Cr					1.575	0.213	0.315		Cr
Cu									Cu
Fe									Fe
Pb									Pb
Mg									Mg
Mn									Mn
Hg									Hg
Ni									Ni
K									K
Se									Se
Ag									Ag
Na									Na
Ti									Ti
V									V
Zn									Zn
B									B
Mo									Mo
Sr									Sr

Samples with analyte concentrations within five times the associated ICB, CCB or PB concentration are listed above with the identifications from the Validation Completeness Worksheet. These sample results were qualified as not detected, "ND".
Note: a - The listed analyte concentration is the highest ICB, CCB, or PB detected in the analysis of each element.

LDC #: 1000684

SDG #: 03-1425

VALIDATION FINDINGS WORKSHEET

PB/ICB/CCB QUALIFIED SAMPLES

METHOD: Trace Metals (EPA SW 846 Method 8010/7000)

Soil preparation factor applied: NA

Sample Concentration units, unless otherwise noted: $\mu\text{g/L}$ Associated Samples: 9

Page: 1 of 1

Reviewer: MG

2nd Reviewer: MW

Sample Identification																			
Analyte	Maximum PB* (mg/Kg)	Maximum PB* (ug/L)	Maximum ICB/CCB* (ug/L)	Blank Action Limit	9														
Al																			Al
Sb																			Sb
As																			As
Ba																			Ba
Be																			Be
Cd																			Cd
Ca																			Ca
Cr		0.301	0.376	1.905	1.7														Cr
Co																			Co
Cu																			Cu
Fe																			Fe
Pb																			Pb
Mg																			Mg
Mn																			Mn
Hg																			Hg
Ni																			Ni
K																			K
Se																			Se
Ag																			Ag
Na																			Na
Tl																			Tl
V																			V
Zn																			Zn
B																			B
Mo																			Mo
Sr																			Sr

Samples with analyte concentrations within five times the associated ICB, CCB or PB concentration are listed above with the identifications from the Validation Completeness Worksheet. These sample results were qualified as not detected, "U".

Note: a - The listed analyte concentration is the highest ICB, CCB, or PB detected in the analysis of each element.

LDC #: 10006 B4

SDG #: 03-1425

VALIDATION FINDINGS WORKSHEET

Field Duplicates

Page: 1 of 1

Reviewer: MG

2nd reviewer: JW

METHOD: Inorganics, Method 200.8

☒ N N/A

Were field duplicate pairs identified in this SDG?

☒ N N/A

Were target analytes detected in the field duplicate pairs?

Analyte	Concentration ($\mu\text{g/L}$)		RPD (Limit)	Difference (Limit)	Qualifier
	11	13			
Cr	2.8	2.5	11		

Analyte	Concentration ($\mu\text{g/L}$)		RPD (Limit)	Difference (Limit)	Qualifier
	15	20			
Cr	2.3	1.9	19		

Analyte	Concentration ()		RPD (Limit)	Difference (Limit)	Qualifier

Analyte	Concentration ()		RPD (Limit)	Difference (Limit)	Qualifier